QUARTERLY SUMMARY OF THE IMPROVEMENTS AND DISCOVERIES IN THE MEDICAL SCIENCES

ANATOMY AND PHYSIOLOGY.

1. *Anatomy of the Prostate.*—According to W. Soetlin, it would appear that the prostate is a conglomerate gland (*Wiener Academie Sitzungsberichte*, vol. 62), the glandulæ composing it being tubular (*Rindfleisch*), and not aciniform. (*Kölliker*, *Henle*, and others). The enveloping material of the individual glandulæ, as might be inferred, being cylindrical and not flat epithelium, as is generally stated. The number of glandulæ in each prostate, Mr. S. has ascertained by the examination of the gland in the cadavers of ten adults to vary from 15 to 32. They are supplied with blood by branches from the arteries distributed to the rectum and bladder; and those distributed along the urethra. —*Centralblatt f. d. Med. Wissenschaften*, No. 22, 1871. D. F. C.

2. *Physiology of the Vagus Nerve.*—L. Concalo (*Ex. Riv. Clin.*, IX. 1870, in *Schmidt's Jahrbuch*, No. 6, 1870), observed in a patient of his that pressure at the neck, upon the left vagus nerve, prolonged the duration of each pulsation of the heart. The same thing happened, as stated by Czermak, when pressure is made at the same point upon the right vagus.—*Centralblatt f. d. Med. Wissenschaften*, No. 28, 1871. D. F. C.

3. *The Absorption of Insoluble Substances.*—That the old statement "corpora non agunt nisi sint soluta" is not absolutely correct, has long been known. Nearly thirty years ago Oesterlen administered unguentum hydrargyri to cats, and found molecules of the metal in their blood. Herbst believed he had satisfactorily demonstrated the absorption of milk and starch corpuscles into the chyle and bloodvessels; and his views were supported by the experiments of Bruch. Donders and Mensonides mingled charcoal with the food of rabbits, and found particles in the blood drawn from every region of the body. Similar researches were undertaken by Marfels and Moleschott, who gave to frogs and dogs blood-corpuscles of sheep and pigment-corpuscles from the choroid, and saw these corpuscles circulating in the web of the frog's foot. Oesterlen, Eberhard, Landerer, and especially Voit, made a series of careful experiments, all showing that if blue ointment were vigorously rubbed into the shaven skin of cats and dogs, minute particles might be found in other and remote organs of the body—as the liver, spleen, pancreas, kidneys, &c. There have been, indeed, some experimenters—as v. Bärensprung, v. Recklinghausen, and a few others—who have obtained only negative results; but, upon the whole, the evidence has been of late years strongly in favour of the possibility of the ab-

sorption of solid substances through the uninjured membranes and skin. Quite recently M. Heinrich Auspitz has given in the *Wiener Medizinischen Jahrbüchern* the results of his experiments on this interesting subject. He has employed a substance which, from its small specific weight and its strongly-defined outline and stability, is quite as serviceable as metallic silver and colouring particles. This is rice-starch meal, which is furthermore easily recognizable by its reaction with iodine and the action of polarized light. The largest rice-starch grains are about twenty times larger than the red corpuscles of the rabbit, whilst the smallest are rather smaller than the red corpuscles. He injected white starch meal as well as starch meal coloured blue with iodine. His first series of experiments consisted of injecting the starch powder into the external jugular vein, the vena cava inferior, and the pulmonary artery, with a view of testing how far it could be recognized when diffused through the tissues of the various organs of the body; and he obtained the general result that the presence of the granules could be almost everywhere easily demonstrated by the appropriate tests mentioned above—as in the lungs, right heart, liver, spleen, kidneys, and brain, and in hemorrhagic exudates. In subsequent experiments he injected starch-molecules suspended in water into the abdominal cavity, and into the subcutaneous connective tissue; in other cases the starch was suspended in oil, and similarly injected; and finally, in another series of cases, the contents of the ductus thoracicus were carefully investigated after injection of the starch into the peritoneal cavity and into the subcutaneous connective tissue. The general results of all these experiments may be thus briefly summed up: Insoluble formed materials are undoubtedly capable of being absorbed, both from the abdominal cavity and from the subcutaneous connective tissue into the circulation; they thus reach the lungs, and, passing through these organs, may enter the systemic circulation. In order to gain entrance into the veins, they traverse the lymphatic vascular system; but it is not yet accurately ascertained whether they enter the circulation exclusively by this route. The epidermis forms a serious but not insurmountable obstacle to absorption of starch-grains from the surface of the skin. All these processes of absorption are materially assisted by the presence of fat, which is absorbed still more readily than starch-grains, and enters the circulation by the same path.—*Lancet*, Sept. 16, 1871.

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4. *Pus and Pus-Corpuscles.*—Two highly interesting memoirs on the chemical composition of pus-corpuscles, and on the chemical composition of pus, by Drs. Miescher and Hoppe-Seyler respectively, have recently been published (Hoppe-Seyler's *Med.-Chem. Untersuch.*, 1871, pp. 441–486); indeed, Professor Hoppe-Seyler—no mean authority—regards Miescher's researches as the most important contribution that has been made of late years to the chemistry of pus. We propose to briefly summarize the results arrived at for the benefit of our readers.

Miescher, in order to obtain pus-corpuscles free from serum, treated pus and fabrics impregnated by it with saline solutions of appropriate density. In these liquids the pus-corpuscles sink to the bottom of the fluid, and may be obtained tolerably pure by repeated washings. Attention was first directed to the albuminoids of the protoplasm. Pus-corpuscles are mainly composed of albuminoids, and, when treated with a solution of common salt, they are converted into a viscid gelatinous mass—a change dependent, as Rovida has shown, on the formation of a ring of hyaline substance around each corpuscle; but this is not due to myosin, for Miescher could obtain no reaction for this body. Five albuminoids were obtained, agreeing (in number, at least) with the five different albuminoids found by Kühne in muscle. These were—alkaline albuminate, undetermined whether kept in solution by alkaline phosphate or not; an albuminoid coagulable at 118° to 120° Fahr., which was not merely albumen dissolved in alkaline phosphate; an albuminoid coagulable at the temperature at which ordinary serum-albumen coagulates; Rovida's hyaline substance; and a fifth albuminoid, the reactions of which need not be described here. Miescher was unable to detect paralbumen, though he does not deny its presence. The alcoholic extract of the globules was only investigated for lecithin and cerebrin, both of which were found to be present, the former in abundance. No glutin or chondrin was found in the watery extract, nor in the serum of pus. It must be understood that a mixture of lecithin and cerebrin forms the substance to which Liebreich assigned the name "protagon"—a highly phosphorized material; for lecithin leaves on incineration an ash very rich in phosphoric acid. But Miescher has also demonstrated the presence of another phosphorized substance in the nuclei of pus-corpuscles, to which he has assigned the name *nuclein;* and he surmises that this body, on account of its phosphorus, plays an important part in cell-growth and in the genesis of the cell albuminoids and their derivatives. Nuclein closely resembles mucin, but is richer in phosphorus, and it appears to exist preformed in the corpuscles.

With reference to the questions of the origin of pus-corpuscles, their identity with the white blood globules and lymph-corpuscles, and their ultimate fate, Hoppe-Seyler's results are remarkably interesting. Since living white blood corpuscles cannot be obtained from the blood in quantity sufficient for chemical analysis, and the spleen, although furnishing them abundantly, contains cerebrin and glycogen (both of which it is necessary to exclude), a novel expedient was adopted. Fresh crystalline lenses from the ox were introduced into the abdominal cavity of dogs, and, as was expected, the lenses became infiltrated with lymph-corpuscles. The presence of glycogen was proved most clearly in the lenses at the period corresponding to the greatest number of active lymph-cells; hence the conclusion that the glycogen comes from these. If, however, the lenses were allowed to stand till the corpuscles became rigid, sugar was found, but no glycogen. Since no glycogen was detected in the pus from inflammatory abscesses and wounds, its occurrence is a means of distinguishing lymph-cells from pus-corpuscles, although these have their origin in the former. With regard to the fatty degeneration of pus, it is stated that lymph-cells by their transformation into non-contractile pus-corpuscles lose their glycogenic properties, and with excess of oxygen may produce fat; whilst by maceration in water many changes take place, which changes are favoured by access of oxygen. Further, yeast-cells and pus-corpuscles seem to be in many respects very closely allied, and the former seem to contain a substance identical with the nuclein of pus.—*Med. Times and Gaz.*, Sept. 23, 1871.

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5. *Congestions that occur consecutive to the Ligature of Arteries.*—Dr. Brown-Séquard, in a note in a late number of his *Journal de Physiologie*, discusses this subject—a subject which has received little attention, but which seems to have sufficient practical bearing to render it worthy of consideration. He states that in December, 1868, M. Prompt announced to the Société de Biologie that the kidney became hyperæmic when the renal artery was tied. M. Moreau, in the discussion that followed this communication, stated that he had obtained similar results in the case of the spleen and intestine after the ligature of the splenic and mesenteric arteries. More recently, M. Teillais, in a treatise on Simple Chronic Ulcer of the Duodenum, reports that he ligatured the vena porta of a dog, and ascertained that two hours and a half afterwards the liver was in a state of great congestion. M. Brown-Séquard's experiments made on dogs, rabbits, and guinea-pigs are in full accordance with these statements, and show that, even when all or nearly all the arterial supply of the kidney, the spleen, or a portion of the intestine, has been cut off, the district supplied by the arteries ligatured becomes remarkably congested, and he has obtained the same result in the case of the liver on tying the portal vein.

These facts, M. Brown-Séquard remarks, are analogous to many others that are well known—such, for example, as the flow of blood from the inferior portion of a ligatured artery, if opened on the distal side of the ligature, and the elevation of temperature that is often observed to take place after the ligature of the principal arterial trunk of a limb. In the case of the limbs he is inclined to advance the same theory in explanation of all these phenomena. It is to the effect that the application of the ligature paralyzes the vaso-motor nerve-filaments that ramify on or in the coats of the artery tied, producing a corresponding paralysis of the ramifications of the vessel; as a consequence of which the blood of the *collateral* vessels, finding a passage widely open for it in the parts supplied by the ligature, flows thitherwards, and produces both the congestion and the concomitant elevation of temperature. In the case of the kidney and of the spleen, however, another explanation must be offered. In both cases the arterial supply may be *entirely* cut off, yet the kidney, if watched after the operation, may be actually seen to swell; and if the renal artery between the ligature and the kidney be divided, hemorrhage occurs, which M. Brown-Séquard states lasted during the eight or ten minutes he permitted the animal to live. It is obvious that a *reflux* of blood must here have taken place; and this is due to the fact that the blood throughout the body is subject to considerable pressure during life, occasioned by the elasticity and contractility of the vessels; but if a vaso-motor paralysis exists in any organ—as the kidney, for example—and if the *vis a tergo* of the blood have ceased in consequence of the interruption of the blood-current in the arteries, the diminution of resistance in the vessels of this organ will cause the blood to regurgitate thither through the veins, and produce congestion.

M. Brown-Séquard remarks in passing, that those experimenters who believe that they have demonstrated that the heart can continue to beat in spite of the stoppage of the circulation through its vessels consequent on ligature of the cardiac arteries, have not taken into consideration the fact that a venous reflux occurs, which fills the vessels of the heart in consequence of the vaso-motor paralysis caused by the application of the ligature.

However this may be, a difference is thus shown by M. Brown-Séquard to exist between the case where a main artery of a limb is tied and that where all the vessels distributed to a definite region—as to the kidney—are ligatured. In the former case the venous reflux cannot take place in consequence of the continuation of the ordinary current of the blood from the arteries to the veins through the collateral channels; whilst in the latter case such reflux must certainly occur. In both instances, however, it may well happen that, the quantity of blood passing in a given time into the part where the vaso-motor paralysis exists being less, whilst the vessels themselves are dilated and consequently capable of containing more blood, this has time to become surcharged with carbonic acid; and we have thus one cause at least of the convulsions and other nerve troubles that are sometimes observed immediately, or almost immediately, after the ligature of one of the primitive carotids in man.—*Lancet*, Dec. 2, 1871.

MATERIA MEDICA AND GENERAL THERAPEUTICS AND PHARMACY.

6. *Eucalyptus Globulus.*—Dr. M. C. MACLEAN states (*Practitioner*, Nov. 1871) that he has used the leaves of this plant in the medical wards of Netley Hospital, in cases of chest aneurisms involving pressure on the vagus or its branches, and in cardiac asthma, with marked benefit. Dr. M. says that, with the exception, perhaps, of the subcutaneous injection of morphia, he knows of no remedy so efficacious as the E. globulus in allaying pain, relieving dyspnœa, calming irritation, and procuring sleep, in patients suffering from the distressing symptoms induced by pressure on the vagus and its branches, caused by aneurisms rising out of the chest.

The mode of using this remedy is for the patient to smoke cigars made from the leaves of the plant, or by smoking the leaves in a pipe.

In cardiac asthma, Dr. M. has known it to allay the terrible dyspnœa of this affection, when the patient was incapable of smoking the leaf as a cigar or in a pipe, by burning portions of the leaf in a plate near the patient, in the way nitre-paper is familiarly used.

Dr. M. is of the opinion that the action of E. globulus is on the nervous system, particularly the vagus.